PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Electro-dynamic Machine Laminated Core

We, ALLMÄNNA SVENSKA ELECTRISKA AKTIEBOLAGET, a Swedish Company, of Västeras, Sweden, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following Statement:—

The present invention relates to an electrodynamic machine laminated core, which core is so constructed that conventional end plates are superfluous.

When laminations are pressed together to form a magnetic core, an even pressure distribution is desired over the whole surface of the laminations. Usually a stiff end plate is placed between each press ring or nut by means of which compression takes place and the active magnetic material comprising the laminated stack, for the purpose of equalising the pressures in the radial direction.

Such end plates require a certain amount of space in the axial direction and thus increases the length of the machine. Even if the end plates are made of magnetic material, as is usually the case, conventionally constructed end plates can contribute only negligibly to conducting the main flux of the machine. They can, however, give rise to considerable eddy current losses which reduce the efficiency and useful power of the machine.

It is known to glue together all the laminations of a laminated core, for example by means of an epoxy resin, and in this way obtain such a stiff and solid plate stack that the end plates may be dispensed with. Particularly with larger motors, however, this method entails a considerable increase in manufacturing costs. Another disadvantage is that with this glueing process it is hardly possible to avoid displacement occurring between the separate laminations so that irregularities arise on the cylindrical surface of the core. Even if, in spite of these irregularities, it is possible to press the core into place in the machine, for example by operating with great tolerances, it is, however, impossible to avoid great heat resistance as a result of these irregularities. This deterioration will be particularly noticeable as regards heat transfer between a glued stator core and the surrounding stator casing. With medium sized machines a difference in temperature of about 10° C has been noted between machines with glued and non-glued magnetic cores under otherwise identical conditions.

These disadvantages are avoided by means of the present invention, according to which an electrodynamic machine laminated core is characterised in that the main part of the laminations are stacked together non-adhesively, while a number of laminations at the ends of the core are mutually fixed by means of layers of adhesive between adjacent surfaces, the latter laminations thus constituting rigid end plates.

By using a magnetic core according to the invention the inactive space taken up by the hitherto used end plates is saved. In other words, the end plates are formed by the glueing together of laminations of the same or a similar type as the laminations of the rest of the magnetic core, whereby the end plates provide a perfectly satisfactory path for the active flux. With a magnetic core according to the invention, therefore, a greater output power can be obtained than from a conventional machine having the same outer dimensions.

At the same time cheaper manufacture is brought about, since the end plates can be manufactured with the same machine tool that makes the ordinary core laminations. Compared with the known magnetic core construction in which all the laminations are glued together, the embodiment according to the invention entails several advantages. Thus the glueing together will be cheaper since only a few laminations have to be glued and the

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other laminations of the core may be mounted one at a time, or in small groups, so that tolerances between, for example the stator casing and the laminations, may be kept small and good heat transfer between the core and the stator casing obtained.

One embodiment of a laminated core in accordance with the invention will now be described, by way of example, with reference to the accompanying drawing, the single Figure of which is a partly sectioned elevation of the casing and stator of an electrodynamic machine.

In the Figure, the numeral 1 designates the electrodynamic machine stator having a stator casing 2. Towards one end the stator casing 2 is provided with an internally fast welded ring 5 and near the other end it is provided with a ring-shaped groove 7 in which a resilient press ring 6 is fitted. Between the stationary ring 5 and the press ring 6 the magnetic core is rigidly held. The magnetic core consists mainly of un-glued laminations 4 which are flanked by two groups 3 consisting of glued laminations. The groups 3 serve as stiff end plates which distribute the pressure forces derived from the rings 5 and 6 evenly over the whole surface of the intermediate laminations.

WHAT WE CLAIM IS:—

1. An electrodynamic machine laminated core characterised in that the main part of the laminations are stacked together non-adhesively, while a number of laminations at the ends of the core are mutually fixed by means of layers of adhesive between adjacent surfaces, the latter laminations thus constituting rigid end plates.

2. An electrodynamic machine laminated core constructed and arranged substantially as herein described with reference to the accompanying drawing.

3. An electrodynamic machine stator comprising the laminated core claimed in claim 1 or 2.

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1 SHEET
This drawing is a reproduction of the Original on a reduced scale.